DOCUMENT RESUME

ED 138 661 UD 016 799

AUTHOR Siegelman, Marvin
TITLE Summer Mathematics Remediation for Incoming Pupils; 1975 High School Umbrella Number 2.
INSTITUTION New York City Board of Education, Brooklyn, N.Y. Office of Educational Evaluation.
PUB DATE 1 Aug 75
NOTE 19p.; New York City Board of Education Function No. 09-61618 (b)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Cocurricular Activities; Compensatory Education Programs; *Dropout Prevention; Grade 9; Grade 10; Individualized Instruction; *Program Evaluation; *Remedial Mathematics; *Secondary Education; Student Interests; *Summer Programs; *Transitional Classes
IDENTIFIERS *Elementary Secondary Education Act Title I; ESEA Title I; New York (New York)

ABSTRACT

Funded under Elementary Secondary Education Act Title I, the Summer Remediation for Incoming Pupils 1975 High School Umbrella #2 program (RIP) was designed to provide remedial instruction in mathematics to incoming ninth and tenth grade pupils who had attended Title I junior high or intermediate schools. The program was designed to bridge the gap in changing schools. By exposing the incoming students to the school staff and curriculum of their new school, the intent was to improve student success and prevent premature drop outs. All 3610 participating students were below grade level in reading and mathematics. The basic method of improving motivation to attend and study were the third period activities. Some of the activities were: shop work, photography, video camera work, typing, sports, journalism, blue-print, speedwriting, newspaper writing, etc. No direct attempt was made to relate the third period activities to the specific content of the remedial math classes. The statistical analysis of 180 ninth grade and 985 tenth grade pupils indicated significant improvement in mathematics skills as measured by the Metropolitan Achievement Test (MAT). An individualized approach and an atmosphere conducive to learning was observed in all schools. (Author/JM)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED138661

EVALUATION REPORT

Function No. 09-61618(b)

SUMMER MATHEMATICS REMEDIATION FOR INCOMING PUPILS

1975 HIGH SCHOOL UMBRELLA # 2

EVALUATION PERIOD

July 7, 1975 - August 1, 1975

Prepared by:

Marvin Siegelman, Ph.D.

An evaluation of a New York City School district educational project funded under Title I of the Elementary and Secondary Education Act of 1965 (PL 89-10) performed for the Board of Education of the City of New York for the summer of 1975.

UD016799

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

DR. ANTHONY J. POLEMENI, DIRECTOR

BOARD OF EDUCATION OF THE CITY OF NEW YORK
OFFICE OF EDUCATIONAL EVALUATION
110 LIVINGSTON STREET, BROOKLYN, N. Y. 11201

TABLE OF CONTENTS

	Page
CHAPTER I: THE PROGRAM	1
CHAPTER II: EVALUATION PROCEDURE	4
CHAPTER III: FINDINGS	5
CHAPTER IV: SUMMARY OF MAJOR FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS	10
EXEMPLARY PROGRAM ABSTRACT	12
MIR SECTION III TABLE 28	13
DATA LOSS FORM	14

CHAPTER I: THE PROGRAM

The Summer Remediation for Incoming Pupils 1975 High School Umbrella No. 2 program (RIP) was designed to provide remedial instruction in mathematics to incoming ninth and tenth grade pupils who had attended Title I junior high or intermediate schools where they were educationally disadvantaged. The RIP summer program of concentrated instruction in basic math skills was also undertaken to bridge the gap in changing schools as well as to help overcome learning difficulties. By exposing the incoming students to the school staff and curriculum of their new school, the intent was to improve student success and prevent premature drop outs.

The selection of students was to be made on the basis of standardized test scores. All participating students had to be below grade level in reading and mathematics There were 25 participating New York City high schools.

The anticipated number of students was 8540, but the actual number serviced was 3610. Despite intense, coordinated, and dedicated attempts to enroll as many eligible students as possible, the number of students starting the program was far below the projected sample. The teachers-in-charge sent out letters to parents, made follow-up calls if there was no response to the letter, and contacted the parent if the child did not attend. Although there were variations in recruitment methods, the evaluator could not discern the superiority of any particular method.

The staff for the RIP program included 1 coordinator, 2 supervisors, 6 teacher-trainers, 25 teachers-in-charge, 92 classroom teachers, 67 educational assistants, and 31 student aides. In some schools the teachers-in-charge could not hire all the educational assistants that they had funds for as assistants received better offers elsewhere. Since most classes were smaller than expected, however, the teachers were able to provide considerable individual instruction even when they did not have an educational assistant.

As a result of being in the remedial math program the pupils were expected to achieve statistically significant growth in their mathematics scores as measured

by The Metropolitan Achievement Test (MAT) in Mathematics. Students in the program were given the MAT at the start and at the end of the program to measure changes in mathematical ability. The MAT was also used to diagnose individual weaknesses, and an individual work program was set up for each student based on this evaluation.

The RIP program was in operation from July 7, 1975 to August 1, 1975. Before the start of this program, math supervisors conducted intensive orientation meetings for participating school staff. A clear, well organized, and detailed description was given of the basic procedures to be followed. For each student, a record sheet was filled out indicating areas of weakness diagnosed from the MAT in addition, subtraction, multiplication, division, fractions, decimals, and percentages. Next to each area on the record sheet there was a reference to the Learning To Compute workbook (LTC) section and pages that had problems to help the student improve his skill for a given MAT weakness. The LTC workbook number one as the basic curriculum resource used to improve basic math skills. A record was kept by the teacher for each student on a class progress sheet indicating areas assigned, attempted, and whether or not the student achieved 80 percent mastery of these areas. Additional mathematical activities to be included were loans and interest, credit, installment buying, metric system, and other systems of numeration During the initial orientation sessions, a variety of additional methods, including games and math kits were suggested and demonstrated. MAT forms, LTC workbooks, Practical Applications in Mathematics workbooks, class progress sheets, student record sheets, folders, and math kits were distributed at the orientation meetings. Math games were also given to some schools where there was a shortage of such materials.

In addition to remedial instruction in the basic skills, a third period was provided which was intended to supplement and reinforce proficiency in mathematics. An industrial arts metal shop, for example, could reinforce computational skills by examining the use of a ruler as a measuring device which could be used to work

on addition of fractions, concepts of size and quantity, etc. The third period was also to provide the opportunity for increasing the motivational level of the student by offering enjoyable activities in addition to the traditional academic routine. During the orientation sessions, the supervisors stressed the importance of making every effort to increase pupil motivation through mathematical games, the use of a variety of materials, third period activities, etc.

Class size was to be no more than 15 pupils in order to facilitate a highly individualized approach to learning, where students could progress at their own rate. Educational assistants were to help in individualizing instruction and to prepare materials and reports. Student aides, who were upper term students in each school, were expected to serve as tutors in the classroom providing individual assistance under the direction of the teacher. The student aides were to develop a "big brother" or "big sister" relationship with the students they were tutoring. This type of relationship could provide the new pupils with familiar faces when they started school in the fall.

The two supervisors who conducted the orientation meetings made periodic visits to all participating schools, assisted the teachers-in-charge and the classroom teachers implement the program, demonstrated curriculum materials, and reported their observations to the program coordinator. The teacher-trainers also made regular visits to all schools and assisted teachers, especially those with less experience, in executing various curriculum methods, emphasizing individual instruction, and supporting as many motivational devices as possible.

In order to determine the extent to which the program was implemented as stated in the proposal, the evaluator attended orientation meetings, pre-test and post-test administrations of the MAT, interviewed and met with the project coordinator, teacher-trainers, supervisors, teachers-in-charge, classroom teachers, educational assistants, and student aides, and made classroom observations of the mathematics and third period activities. The evaluator also examined all of the routine curriculum materials used in the project.

The program was in operation from July 7, 1975 through August 1, 1975.

CHAPTER II: EVALUATIVE PROCEDURES

The evaluation objectives were:

1. To determine whether as a result of participation in the Remedial Mathematics Skills Program, the mathematics grade of the participating students would show a statistically significant difference between the pre-test and post-test scores.
2. To determine the extent to which the program as actually carried out, coincided with the program as described in the Project Proposal.

In order to determine whether the math grade level improved significantly, Form H of the Metropolitan Achievement Test (mathematics computational skills) was administered to all students during the first week of the program, and Form G of the MAT was given during the final week. Most of the pre-testing was done on July 7, 1975, and most of the post-test data were collected on July 30, 1975.

Data were collected for 3610 students. Because of truancy or not completing the program, data on the MAT were incomplete for 775 pupils (731 were absent from the post-test, 17 did not take the pre-test, and 27 did not show up for the pre-test and the post-test). There were 514 (22%) ninth grade pupils with incomplete MAT records. For tenth grade students, 261 (21%) had incomplete MAT data. The total number of students evaluated on the MAT was 1850 ninth grade pupils and 985 tenth grade pupils. The data were collected from the 25 participating high schools and a correlated t test was computed to see if there was a significant difference between the pre-test versus the post-test mean MAT scores.

CHAPTER III: FINDINGS

Data Analysis

Evaluation objective number one was examined by computing a correlated t test for the pre-test (Form H) versus the post-test (Form G) mathematics scores on the MAT. The t test results can be found in Table 1. The mean pre-test

Table 1

Comparison of Pre-test versus Post-test Mean Grade Equivalency Mathermatics MAT Scores by Grade Level

	Pre-test			Post-test				
Grade	N	M	SD	N	M	SD	t	p
9	1850	6.79	1.50	1850	7.42	1.53	25.71	<.001
10	985	6.97	1.69	985	7.56	1.73	17.05	<.001

score for ninth grade pupils (N=1850) was 6.79 and the standard deviation was 1.50. The mean post-test score for ninth grade pupils was 7.42 and the standard deviation was 1.53. The difference on mathematics achievement between the pre-test and the post-test scores was significant (correlated t = 25.71) beyond the .001 level of confidence. The correlation between the pre-test and the post-test scores was .798. For the tenth graders (N=985) the mean pre-test score was 6.97 and the standard deviation was 1.69. The mean post-test score for the tenth grade students was 7.56 and the standard deviation was 1.73. There was a significant difference (correlated t = 17.05) between the pre-test and post-test mathematics scores for the tenth grade pupils beyond the .001 level of confidence. The correlation between the pre-test and post-test MAT scores was .768. For ninth graders the pre-test versus the post-test mean difference on the MAT was .63, and for the tenth graders this mean difference was .59. Because the RIP

program consisted of approximately 16 days of instruction, the grade-equivalency difference scores of .53 and .59 are quite impressive. Improvement that could normally take half a year or more appears to have occured in 16 days. The MAT pre-test versus post-test correlations of .798 and .788 indicate that for the present samples the consistency or reliability of the MAT was quite good.

It should be noted, in addition, that the ninth and tenth grade pupils were, on the average, two years below grade level on their pre-test MAT scores. Thus, the selection criteria of being below grade level in mathematics was applied for most pupils. There were, however, 182 ninth grade pupils who scored at the ninth grade math level on the MAT pre-test, and 52 tenth grade pupils who scored at the ninth grade mathematics level on the MAT pre-test. For approximately 10 percent of the ninth grade pupils and approximately 5 percent of the tenth grade students, the selection of below grade students was not accurate. Perhaps more exclusive reliance on standardized test results when selecting eligible students would reduce the number of students who should not be in the program.

An important unanswered question is whether the improvement noted on the MAT will continue to be reflected in the years to come or will it dissipate. A follow up study is indicated in which the pupils in this program are compared to a comparable group of students who did not participate in the RIP project on math achievement.

It must also be recognized that the one-group MAT pre-test versus MAT post-test design used in the present evaluation does not permit conclusions implying a causal relationship between the RIP program and improvement in MAT scores. The data indicate a significant improvement in math scores, which hopefully was due to the summer RIP program, but some alternative explanations for this gain can not be ruled out. For example, the students could have been more tense on the pre-test and so did better on the post-test; since the pupils were volunteers

and thus motivated, they could tend to learn more under most circumstances, etc.

Although not set forth as a specific evaluation objective, it was noted in the evaluation design that "the benefit of exposing new students to the school staff and offerings will improve the changes of students success, reduce failure and prevent premature dropping out." This general goal appears to be intended for future school experiences and could of course not be directly evaluated during the duration of the summer 1975 RIP program. The prediction of future academic success and reduced dropout rate based on the summer remediation experience are important considerations and again suggest the need for some type of follow up study, especially where a control group is included.

An additional type of data analysis was suggested by the program coordinator which did not appear in the present evaluation design. It was suggested that an evaluation of the class Progress Sheets be made noting the percent of students who attempted to improve their mathematics weaknesses, and the percent who showed 80% mastery of these MAT weaknesses. The evaluator would agree that the day to day progress in the basic math skills is a fundamental goal of the RIP program and should be carefully evaluated. This type of analysis, however, could not be made in the present report.

Class Atmosphere

The atmosphere in almost all classes observed was especially conducive to learning. The students who volunteered for this program worked conscientiously and continuously, they received a great deal of individual instruction, the rooms and halls were quiet, and the pupils were relaxed, well behaved, and appeared motivated to learn. Almost all the teachers were hard working, competent, patient, concerned, well organized, pleased with their pupil's work and attitudes, and with the program in general, and wished that the regular school year could be like this summer program. Almost no discipline or acting out problems were observed and the students appeared to be pleased with their success and progress.

The absence of a report card, a potential punishment for poor work, may have added to the reduced pressure and anxiety about achievement.

Supplies and Facilities

All teachers-in-charge and classroom teachers indicated that they had enough materials and supplies for this summer program. Only a few teachers used desk calculators. In most of the schools the calculators were in storage for safe-keeping and could not be used. Most of the teachers, however, preferred not to use them for so short a program even when they were available. The teachers indicated that the time spent on calculators, which could be mostly motivational rather than didactic, could be better spent working on basic skills through workbooks, kits, and games. Most materials used during the school year, with the exception of machines, were available for use in the summer program and they were widely utilized.

The facilities in most schools were quite adequate and enhanced individualized instruction. Usually the RIP program was the only program in the school and so space was never a problem.

Motivational Approaches

The basic method of improving motivation to attend and study was the third period activities. The administrators, teachers, and students all agreed that the third period was worthwhile and did indeed increase motivation. The third period included a wide range of activities that differed from school to school. Some of the activities were shop work (woodworking, metal, electricity), photography, vidio camera work, typing, sports (basketball, weight lifting, basefall) journalism, blueprinting, speed writing, newspaper writing, etc. No direct attempt was made to relate the third period activities to the specific content of the remedial math classes. In some classes, however, especially the shops, there was practice in math related areas, such as reading a ruler.

Math games were used to reward students for doing well in their workbooks,

or to break up the hour or week with different activities. The teachers and pupils enjoyed the games but there was some indication that they were used too infrequently in some classes.

A few activities outside of the program were also utilized to motivate the pupils. In several schools the students were given either free breakfast or free lunch. The teachers-in-charge noted that free breakfast or lunch was enormously popular and one of the best ways of motivating students to come. In one school, arrangements were made for the students to use a nearby swimming pool after the program activities ended. In a few schools, free transportation was provided to and from the school.

Additional Findings

The key feature of the RIP program was the setting up and execution of a systematic, individualized, simple and direct attack on the math weaknesses of pupils as diagnosed from the MAT results. The simple and well designed structure was excellently presented at the orientation meetings and follow-up school visits, and very well executed by the high school staff members. There was also notable consistency of math instruction from school to school which seemed to reflect the presentation of a workable and appealing design.

No class was observed with more than 15 students. The typical class included between 8 and 12 students. Class size was totally commensurate with individualized attention.

In all but one class observed, there was no student aid in the classroom. When the student aid was present, he was not doing tutorial work. The student aides spent most of their time assisting school administrators with office work, with secretarial jobs, or in trying to find out why pupils did not show up and to try to get them to come to school. It did not appear that a "big brother" or "big sister" relationship was developed between the student aides and the new students as the aides were not doing tutorial work.

CHAPTER IV: SUMMARY OF MAJOR FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The statistical analysis of the mean MAT pre-test versus post-test scores indicated a significant improvement in mathematics ability for both ninth and tenth grade pupils, a grade equivalent of about a half year. This improvement occured after 16 days of instruction. The fundamental aspects of individualized instruction based on a systematic diagnosis of the MAT with maximum effort to increase motivation to learn were very well executed in the RIP program. Facilities and supplies were quite adequate to carry out the program as described in the proposal.

Conclusion

Considering the enthusiasm of staff and students and the impressive gains in math achievement, the program can be considered clearly successful, and it is recommended that the program be continued.

Recommendations

1. Have student aides devote more time to tutoring in the classroom and less time as administrators assistants.
2. Use post-test MAT scores for diagnosis and placement of pupils when they start high school.
3. Give free breakfast and/or lunch.
4. Use standardized mathematics tests to determine eligibility of all pupils for the program.
5. Give students high school credit for summer work.
6. Have coordinator and supervisors make recommendations to the teachers-in-charge concerning recruitment methods. The teacher-in-charge should continue to have independent responsibility for pupil recruitment.
7. Provide two-way fare for transportation to high school.

8. Conduct evaluation of RIP program by using a comparison group.

9. Conduct a follow up study to examine the longevity of gains made in math skills and the reduction in drop-out rate.

10. Attempt to include more math components in third period activities.

11. Do evaluation of day-to-day progress in math skills as noted on class Progress Sheets.

EXEMPLARY PROGRAM ABSTRACT

Title: Summer Remediation for Incoming Pupils 1975 High School Umbrella # 2

Component Codes: 60915 (9th grade), 60916 (10th grade)

Activity Code: 720 **Objective Code**: 801

Program

The Summer Remediation Program for Incomming Students serviced 3610 pupils in 25 high schools during July, 1975. The basic program objective was to improve computational skills of pupils who were below grade level in math through individualized instruction based on weaknesses diagnosed from The Metropolitan Achievement Test results.

Summary of Findings

The statistical analysis of 1850 ninth grade and 985 tenth grade pupils indicated significant improvement in mathematics skills as measured by the MAT. For ninth grade students the mean pre-test score was 6.79, the mean post-test score was 7.42, and this gain of a .63 grade equivalency score was significant beyond the .001 level of confidence. Tenth grade pupils had a mean pre-test score of 6.97, a mean post-test score of 7.56, and a grade equivalency gain score of .59, significant beyond the .001 level of confidence.

A highly individualized approach was observed in all schools in an atmosphere that was highly conducive to learning. The systematic, highly structured, and simple instructional approach based on MAT weaknesses was well received by both pupils and staff.

Conclusion

An impressive amount of improvement occured in MAT mathematics skills when individualized instruction was used to systematically attack weaknesses diagnosed from the MAT data.

Use Table 28 for norm referenced achievement data not applicable to Table 26. (See "Instructions" Item 5 before completing this table.)

28. Standardized Test Results

In the table below, enter the requested assessment information about the tests used to evaluate the effectiveness of major project components/activities in achieving desired objectives. Before completing this form, read all footnotes. Attach additional sheets if necessary. 27

Component Code	Activity Code	Test Used 1/	Form		Level		Total N 2/	Group ID 3/	Number Tested		Pretest			Posttest			Statistical Data		Subgroup 9/
			Pre	Post	Pre	Post			4/ N	5/	Date	Mean	6/ SD	Date	Mean	6/ SD	7/ Test	8/ Value	
60915	720	MAT/70	H	G	Adv	Adv	2364	Grade9	1850	1	7/7	6.79	1.5	7/30	7.42	1.5	corr. t test	25.71	p < .001
60916	720	MAT/70	H	G	Adv	Adv	1246	Grade10	985	1	7/7	6.97	1.7	7.30	7.56	1.7	corr. t test	17.05	p < .001

1/ Identify test used and year of publication (MAT-58; CAT-70, etc.)

2/ Total number of participants in the activity.

3/ Identify the participants by specific grade level (e.g., grade 3, grade 5). Where several grades are combined, enter the last two digits of the component code.

4/ Total number of participants included in the pre and posttest calculations.

5/ 1 = grade equivalent; 2 = percentile rank; 3 = z score; 4 = Standard score (publisher's); 5 = stanine; 6 = raw score; 7 = other.

6/ SD = Standard Deviation

7/ Test statistics (e.g., t; F; X^2).

8/ Obtained value

9/ Provide data for the following groups separately: Neglected (code as N), Delinquent (code as D), and Handicapped (code as H). Place the indicated code letter in the last column to signify the subgroup evaluated.

OFFICE OF EDUCATIONAL EVALUATION - DATA LOSS FORM

(attach to MIR, item #30) Function #0961618(b)

In this table enter all Data Loss information. Between MIR, item #30 and this form, all participants in each activity must be accounted for. The component and activity codes used in completion of item #30 should be used here so that the two tables match. See definitions below table for further instructions.

Component Code	Activity Code	(1) Group I.D.	(2) Test Used	(3) Total N	(4) Number Tested/ Analyzed	(5) Participants Not Tested/ Analyzed		(6) Reasons why students were not tested, or if tested, were not analyzed	
						N	%		Number/ Reason
6 0 9 1 5	7 2 0	Grade 9	MAT/70	2364	1850	514	21.74	pre-test and/or post-test scores	
								missing due to truancy	514
6 0 9 1 6	7 2 0	Grade 10	MAT/70	1246	985	261	20.95	pre-test and/or post-test scores	
								missing due to truancy	261

(1) Identify the participants by specific grade level (e.g., grade 3, grade 9). Where several grades are combined, enter the last two digits of the component code.
(2) Identify the test used and year of publication (MAT-70, SDAT-74, etc.).
(3) Number of participants in the activity.
(4) Number of participants included in the pre and posttest calculations found on item#30.
(5) Number and percent of participants not tested and/or not analyzed on item#30.
(6) Specify all reasons why students were not tested and/or analyzed. For each reason specified, provide a separate number count. If any further documentation is available, please attach to this form. If further space is needed to specify and explain data loss, attach additional pages to this form.